

FIG. 1



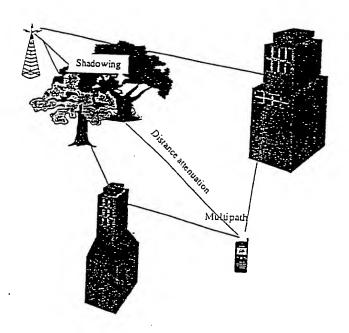
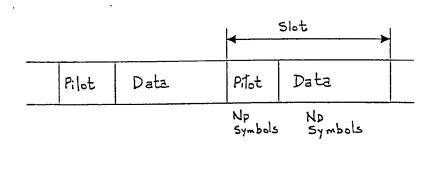


FIG. 2



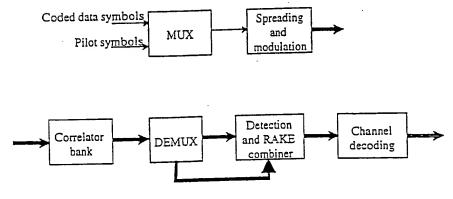


FIG. 3



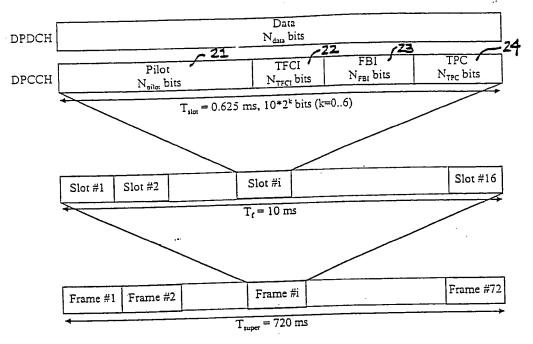


FIG. 4

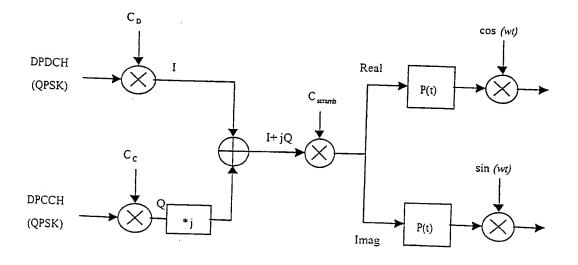
Channel Bit	Channel Symbol	SF	Bits/	Bits/	N <sub>pilot</sub>	N <sub>TPC</sub>	N <sub>TFCI</sub>	$N_{\text{FBI}}$
Rate (kbps)	Rate (ksps)		Frame	Slot				
16	16	256	160	10	6	2	2	0
		256	160	10	8	2	0	0
16	16			10	5	2	2	1
16	16	256	160	10	<u> </u>			
16	16	256	160	10	7	2	0 ·	1
16	16	256	160	10	[6]	[2]	[0]	[2]
		256	160	10	[5]	[1]	[2]	[2]
16	16	230	100			` '		

FIG. 5

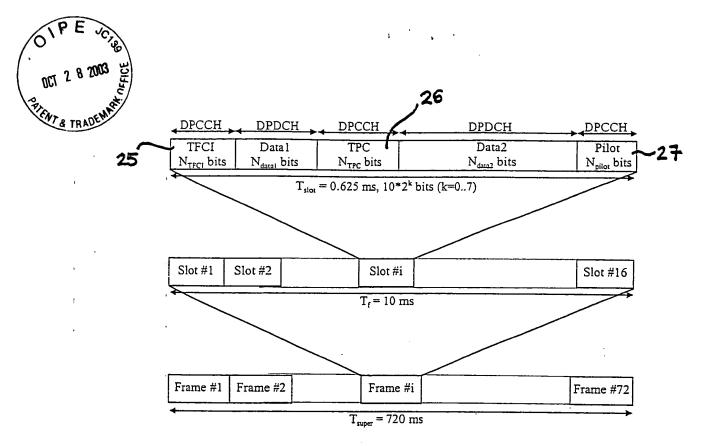


			N <sub>pilot</sub>	= 6						N <sub>pilot</sub>	= 8			
Bit #	0	1	2	3	4	5	0	1	2	3	4	<u>,</u> 5	6	7
Slot #1,	1	- 1	1	1	.4	1 :	ı	1	1	1	l	1 -	ı	1 ,
2	1	1	· 1	1	0	1	1	1	1	1	1	0	I	1.
3	1	0	1	I	0	1	1	0 1	i	1	1	. O -	1	1
4	1	1.1	0	ı	0	1	1		I	0	1	0	ı	1
5 <sup>±</sup>	1	1	ō	ı	1	í	1	新疆	1	0	1	2356 51 V	1	1
6,	1	141	0	1	1 =	1	1	1 3	1	. O	1	15.	1	100
7	l	. 0	1 "	1	0	0	1	0	1	35 <sub>6</sub> -5	1	0	1	
8	1	1	0	1	Ö		1	¥ <b>1</b>	1	0	ı			
9	1	31	-1 s	1	0	0	1		1		•		1	
10	1	201		1	0	1	1	200	1		,		•	U
11	1	1		1			1	143	,				1	
12			#2 / T	1			·		1		1		I	0
13				•			1	0	l		1	0	1	1
	1	, <b>O</b>	0 =	I	0	1	1	.0	1	0	1	0	1	313
14	1	1	. 0	1	0	0	1	1 3	1	.0	1	. O	1	0
15	1	0	1	1	0	0	1	0	l	1	1	0	1	0
16	1	0	0	ì	0	0]	1	0	1	0	ı	. o	i	0

FIG. 6



**FIG.** 7

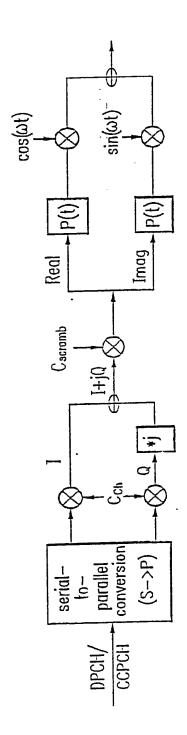


**FIG.** 8

Symbol rate	8	ksps	16,	32,64	,128	3ksps			256	5,512,	102	4ksps		
Symbol #	0	1	0	1	2	. 3	0	1	2	.3	4	5	6	7
Slot # 1	11		11	11	11	11	11	11	11	-11-	11	11		10
2	11	11	11	11-	11	01	11	10	11	10	11	10	11	.01
3	11	10	11	01	11	01	11	10	- 11	01	11	11		01
4	11	01	11	10	11	0Ī	11	11	11	01	11	00	11	10
5	11	10	11	10	11	11	11	11	11	00	11	01	11	10
6	11	.10	11	10	11	11	11	11	11	11	11	01	11	10
7	11	01	11	01	11	00	11	10	11	11	11	01	11	10
8	11	00	11	10	11	01	11	01	11	00	11	10	11	00
9	11	.00	11	11	11	00	П	ii .	11	10	11	00	11	01
10	11	10	11	01	11	01	11	01	11	11	11	11	11	00
11	11	10	11	11	11	10	11	10	11	10	11	11	11	10
12	11	iì.	11	01	11	01	11	01	11	10	11	10	11	00
13	11	10	11	00	11	10	11	10	11	01	11	11	11	10
14	11	11	11	10	11	00	11	00	11	10	11	10	11	00
15	11	00	11	01	11	00	11	01	11	10	11	00	11	00
16	11	00	11	<b>0</b> 0	11	00	11	10	11	00	11	00	11	00

FIG. 9

FIG. 10



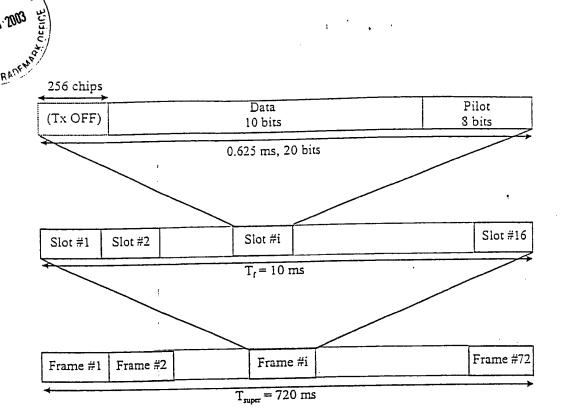


FIG. 11A

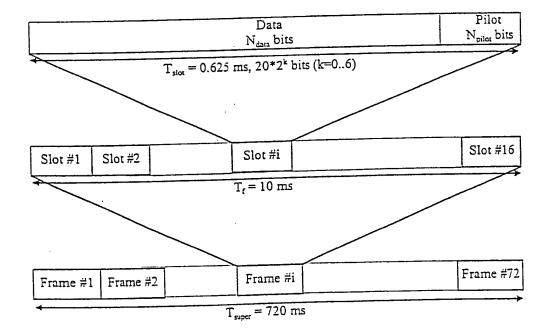


FIG. 11B



	Frame Synchronization Words	
Slot Number	1 2 3 4 5L	
	$C_1 = (1 \ 1 \ 0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 0 \ 0 \ $	'
	$C_2 = (1\ 0\ 0\ 0\ 1\ 0\ 1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1)$	
	$C_3 = (1\ 1\ 0\ 1\ 1\ 1\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 1\ 1)$	
	$C_4 = (0\ 1\ 1\ 1\ 0\ 1\ 1\ 0\ 1\ 0\ 0\ 1\ 0\ 1)$	1
	$C_5 = (1\ 0\ 1\ 1\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1)$	!
	$C_6 = (1 \ 1 \ 1 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 1 \ 1$	,
	$C_7 = (0\ 1\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 0\ 1\ 1\ 1\ 1\ 0\ 0)$	
	$C_s = (1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 0 \ 1 \ 0 \ 0 \ $	

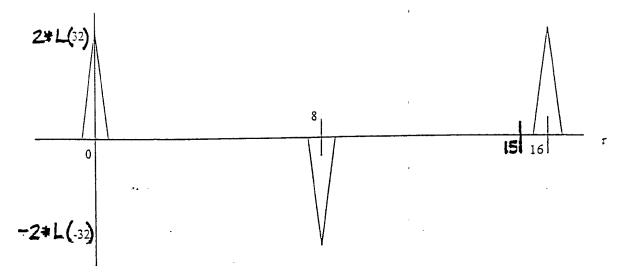
FIG. 12A

R(τ) τ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$R_{\rm E}(\tau)$	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
$R_{\rm F}(\vec{r})$	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
$R_{\rm G}(z)$	16	4	0	-4	0	4	0	-4	-16	-4	0	4	0	-4	0	4
$R_{\rm H}(z)$	16	-4	0	4	0	-4	0	4	-16	4	0	-4	0	4	0	-4_
		·	<u>'</u>													
	R <sub>4</sub>											20				

FIG. 12B



 $(R_{\mathsf{E}}(z) \div R_{\mathsf{F}}(z))$ , or  $(R_{\mathsf{G}}(z) \div R_{\mathsf{H}}(z))$ 



**FIG. 13A** 

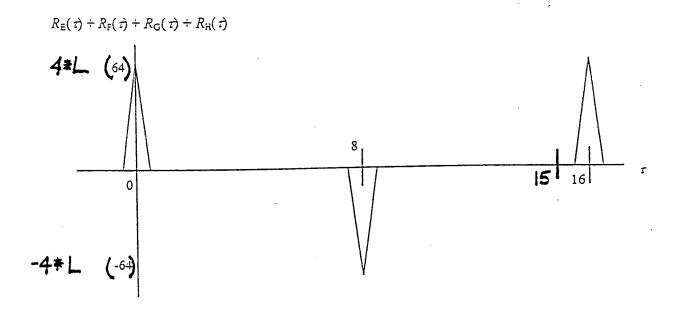


FIG. 13B



	N	- - 1010x =	5		N <sub>pilot</sub> :	<b>=</b> 6	
Bit≓	0 7 1	2		0		3	
Slot#1		1	L 0 7	1		1	
2	\$1 = 20	l		1	13.750	1	
3	0.300	1	0 10 1	1	0.200	1	0 10 11
4	12.0	i		1		1	
5		1		1		1	152.10
6	1 7 0 0 1	1		1	1 0	1	
7		1	0 1	1		1	0 7
8	1 0	1	20 2800	1	0.5	1	0 2 3 0
9	0 0	1	50 £ 1.5	1	20.506	. 1	07 15 21
10	0 101	1	0 124 0	1	Ö 7	1	0.00
11		1	71 = 0	1		l	20
12	10 8 50 6	1	0 2 0	1	303.71	1	0.200
13	0 - 0 -	1		1	0.00	1	0.00
14	10 2 21	ı	0 7 0	1	5070212	1	20.000
15	70 7 0	1	77.00	1	0.50	1	
16	0 2 1	. 1		1	<b>2021</b>	1	

FIG. 14A

	1			•								
		N,	ilos =	· <b>7</b> .				Npilot	= 8			
Bit#	0	1 2 2	3	45.53	6	0	2 2	疆盟	4	\$25 \$25 \$3	6	
Slot #1	1		1	131 100	1	1			1		1	100
2	1	10.0	ı		ı	1	1	0	1		1	
3	1	<b>0</b> ; <b>3</b> , 6	ı		1	1	1	0	1	60	1	
4	1		l		1	1	1	10. 10.	1		1	
5	1		1	10 TO	1	1	1		1		1	
6	1		1		1	1	1	20	1		1	
7	1		1	0.00	1	1	1		1	20	.1	
8	1	1 2 0	1	0 0 0	1	i			1	0.3	1	0
9	1	\$10.50 S	1	0	1	1			1		. 1 -: No.	
10	1		1	0 0	1	1			1			
11			1		1	1	202		1			
12 13			1		1	1	203 1		1	100	i	
13	,		1		1	1	100		1		≘ 1	20°
15	1	X0	1		1	1	20 S 1	<b>第</b> 0页	· .		1	20 E
16	1	0 2 1	1		1	1	1		1		1	

FIG. 14B



N <sub>pilot</sub>	Pilot bit position#	Corresponding word of length 16
	. 0	C <sub>1</sub>
_	1	C <sub>2</sub>
5	. 3	C <sub>3</sub>
	. 4	C <sub>4</sub>
	1	C <sub>1</sub>
_	2	C <sub>2</sub>
6	4	C <sub>3</sub>
	5	C <sub>4</sub>
	1	. C <sub>1</sub>
_	. 2	C <sub>2</sub>
7	4	C <sub>3</sub>
	5	C <sub>4</sub>
	1	C <sub>1</sub>
	3	C <sub>2</sub>
8	5	. C <sub>3</sub>
	7	C <sub>4</sub>

FIG. 14C



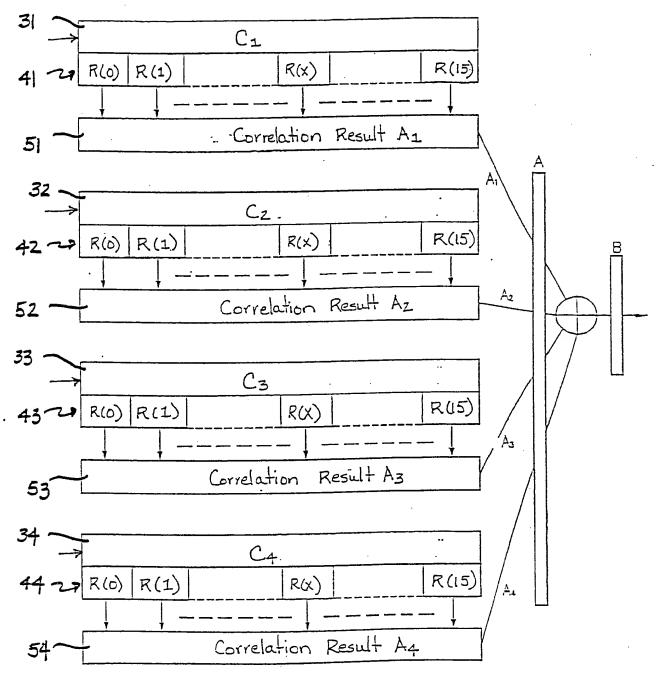


FIG. 14D

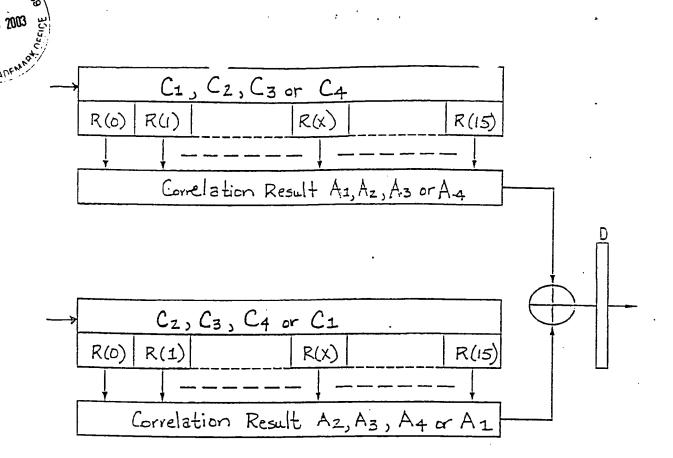


	R <sub>x</sub> (0)	R <sub>x</sub>	R <sub>x</sub> (2)	R <sub>x</sub> (3)		R <sub>x</sub> (5)	R <sub>x</sub> (6)	R <sub>x</sub> (7)	R <sub>x</sub> (8)	R <sub>x</sub> (9)	R <sub>x</sub> (10)	R <sub>x</sub> (11)	R <sub>x</sub> (12)	R <sub>x</sub> (13)	R <sub>x</sub> (14)	R <sub>x</sub> (15)
A <sub>i</sub> POINT	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
A <sub>2</sub> POINT	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
A <sub>3</sub> POINT	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
A <sub>4</sub>	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
B POINT	64	0	0	0	0	0	0	0	-64	0	0	0	0	0	0	0

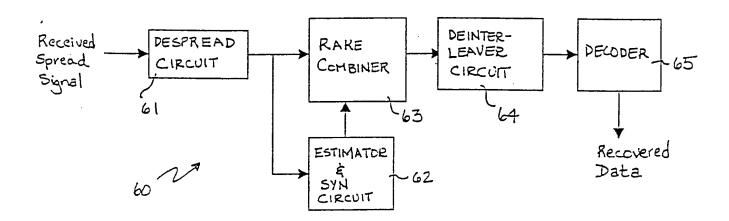
FIG. 14E

	R <sub>x</sub> (0)		R <sub>x</sub> (2)		R <sub>x</sub> (4)	R <sub>x</sub> (5)			R <sub>x</sub> (8)	R <sub>x</sub> (9)	R <sub>x</sub> (10)	R <sub>x</sub> (11)	R <sub>x</sub> (12)	R <sub>x</sub> (13)	R <sub>x</sub> (14)	R <sub>x</sub> (15)
$A_1$ POINT $\div A_2$ POINT	32	.0	0	0	0	0	0	0	-32	0	0	0	0	0 .	0	0
A₃ POINT +A₄ POINT		0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0 ·
A <sub>1</sub> POINT ÷A <sub>4</sub> POINT		0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0
$A_2$ POINT $\div$ $A_3$ POINT		0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0

**FIG. 14F** 



**FIG. 14G** 



**FIG. 14H** 



	R <sub>x</sub>	R <sub>x</sub> (1)	R <sub>x</sub> (2)	R <sub>x</sub> (3)	R <sub>x</sub> (4)	R <sub>x</sub> (5)	R <sub>x</sub> (6)	R <sub>x</sub> (7)	R <sub>x</sub> (8)	R <sub>x</sub> (9)	R <sub>x</sub> (10)	R <sub>x</sub> (11)	R <sub>x</sub> (12)	R <sub>x</sub> (13)	R <sub>x</sub> (14)	R <sub>x</sub> (15)
A <sub>1</sub> POINT	16	-4	-4	8	0	-4	0	0	-4	0	0	-4	0	8	-4	-4
A <sub>2</sub> POINT	16	0	0	-4	-4	-4	0	0	12	0	0	-4	-4	-4	0	0
A <sub>3</sub> POINT	16	4	0	0	4	8	8	0,	0	0	8	8	4	0	0	4
A <sub>4</sub> POINT	16	0	4	-4	0	0	-4	4	0	4	-4	0	0	-4	4	0
. B POINT	64	0	0	0	0	0	4	4	8	4	4	0	0	0	0	0

FIG. 14I

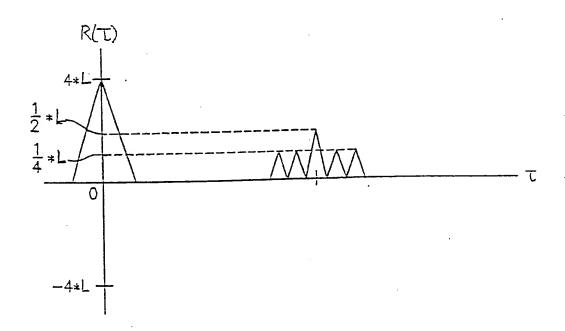


FIG. 14J



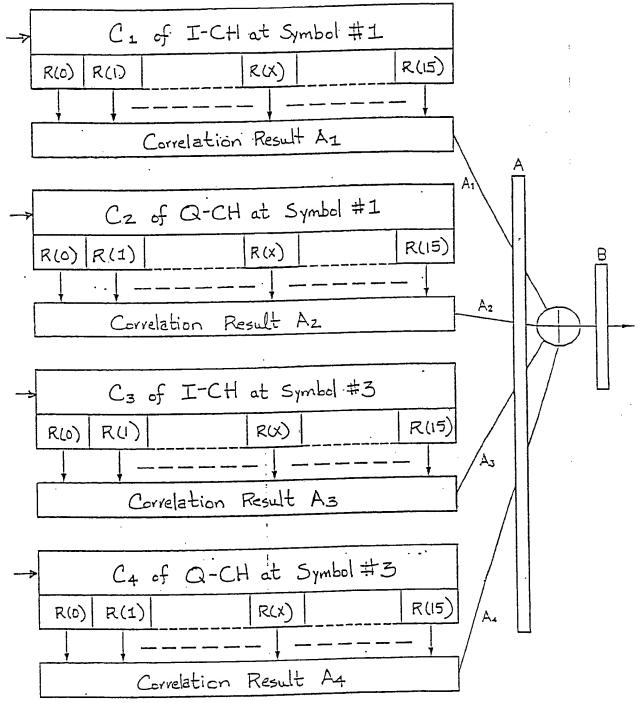
	N <sub>pi</sub> ,	4		$N_{pilot}$	= 8					rpilot '	= 16			
Symbol #	0	i)	0	1	2	33	0	対要	2	3	4	5.1	6	为点
Slot #1	11	11	11	11	11	10	11	11	11	10	11	11,	11	.01
2 -	11	10	11	10	11	<u>-11</u>	11	10	11	11	11	01	11	11
3	11	.00	11	00.	11	01	11	00	11	01	11	11	11	01
4	11	10	11	-10	11	11	11	10	11	11	11	10	11	00
5	11	11	11	11	11	10	11	11.	11	10	11	00	11	01
6	11	10	11	10	11	11	11	10 =	11	111	11	01	11	00
7	11	11	11	11.	11	£01	11	11	11	01	11	.00	11	10
8	-11	10	11	10	11	00	11	10	11	00	11	01	11	.11
9	11	00	11	.: 00	11	01	11	00	11	01	İl	.00	11	.10
10	11	01	11	01	11	00	11	01	11	00	11	10	11	.00
11	11	111	11	113	11	10	11	111	11	10	11	00	11	10.
12	11	01	11	01	11	00	11	01	11	00	11	01	11	ii.
13	11	.00	11	00	11	101	11	00	11	01.	11	313	11	±10 ±
14	11	01	11	01	11	00	11	01	11	00	11	10	11	111
15	11	00	11	00	11	10	11	00	11	10	11	11	11	01
16	11	01	11	01	11	11	11	01	11	11	11	-10	11	00

FIG. 15A

Symbol rate	Symbol #	Channel	Corresponding Word of length L=16	
		I-CH	C <sub>1</sub>	
$N_{pilot} = 4$	1	Q-CH	C <sub>2</sub>	
		I-CH	Ci	
	1	Q-CH	C <sub>2</sub>	
$N_{pilot} = 8$		I-CH	C <sub>3</sub>	
	3	Q-CH	C4	
•		I-CH	C <sub>1</sub>	
	1	Q-CH	C <sub>2</sub>	
		I-CH	C <sub>3</sub>	
	3	Q-CH	C.	
$N_{pilot} = 16$		I-CH	C <sub>5</sub>	
	5	Q-CH	C <sub>6</sub>	
		I-CH	С,	
	7	Q-CH	C <sub>8</sub>	

FIG. 15B





**FIG. 15C** 



Symbol #	0	13	2	3.
Slot #1	11	11	11	10
2	11	10	11	11
3	11	.00	11	01
4	11	10	11	11
5	11	11	11	-10
6	11	10	11	11
7	11	11	11	01
8	11	10	11	00
9	11	00	11	01
10	11	01	11	00,
11.*	11	11	11	10
. 12	11	-01	11	00
13	11	.00	11	ΟĪ
14	11	01	11	00
15	11	00	11	10
16	11	.01	11	11

**FIG.** 16A

Symbol#	Channel	Corresponding word of length 16		
1	I-CH	C <sub>1</sub>		
1	Q-CH	C <sub>2</sub>		
2	I-CH	C <sub>3</sub>		
	Q-CH	C <sub>4</sub>		

FIG. 16B



		·pilot	= 8					N <sub>pilot</sub>	= 1			
Symbol #	0	1	2	3	0	¥1.5	2	3	4	5	6	7
Slot #1	11	11	11	10	11	11	11	10	11	11	11	01
2	11	10	11	11	11	10	11	11	11	01 ·	11	11
3	11	.00	11	01	11	00	11	01	11	-11	11	01
4	11	10	11	11	11	10	11	11	11	10	11	00
5	11	.11	11	10	11	11	11	10	11	.00	11	_01
6	11	10	11	11	11	-10	11	11	11	01	11	-00
7	11	11	11	01	11	11	11	01	11	00	11	10
8	11	10 ]	11	-00	11	-10	11	00	11	01.	11	11
9	11	-00	11	01	11	00	11	01	11	-00	11	10.
10	11	01	11	00	11	01	11	00	11	10	11	-00
11	11	11	11	10	11	11	11	10	11	00	11	10
12	11	01	11	00	11	01	11	00	11	01	11	11.
13	11	00	11	01	11	00	11	a <b>01</b>	11	11	11	10
14	11	01	11	00	11	01	11	00.	11	10	11	11
15	11	.00	11	10	11	00	11	10	11	11	11	01
16	11	01	11	11	11	01	11	11	11	10	11	00

FIG. 16C

Symbol rate	· Symbol #	Channel	Corresponding word of length 16
		I-CH	C <sub>1</sub>
	1	Q-CH	C <sub>2</sub>
$N_{\text{pilot}} = 8$		I-CH	C <sub>3</sub>
	3	Q-CH	C <sub>4</sub>
		I-CH	Cı
	1	Q-CH	C <sub>2</sub>
		I-CH	C <sub>3</sub>
	3	Q-CH	C <sub>4</sub>
$N_{pilot} = 16$		I-CH	C <sub>5</sub>
	5	Q-CH	C <sub>6</sub>
		I-CH	C <sub>7</sub>
	7	Q-CH	C <sub>3</sub>

FIG. 16D



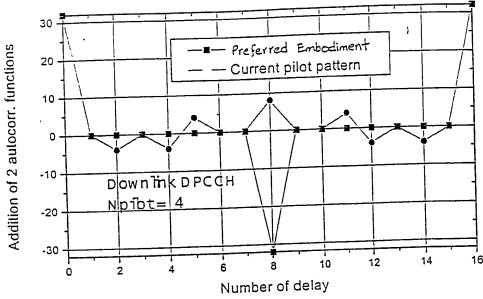


FIG. 17A

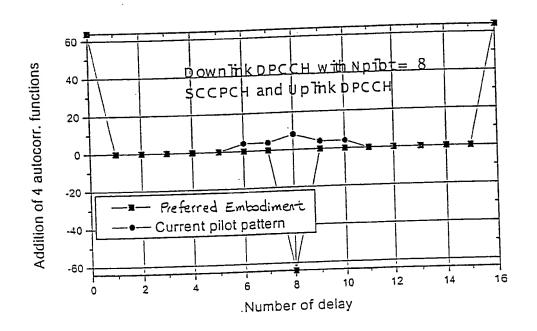


FIG. 17B



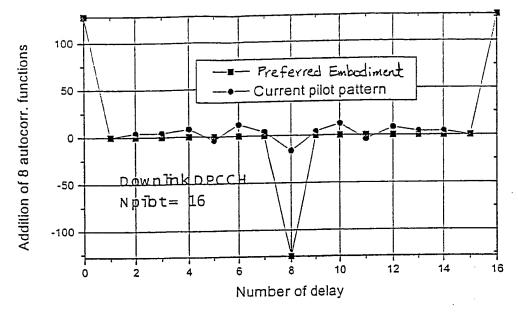
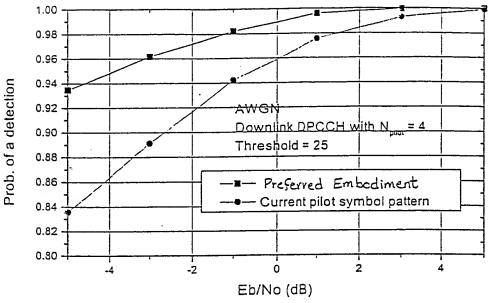


FIG. 17C

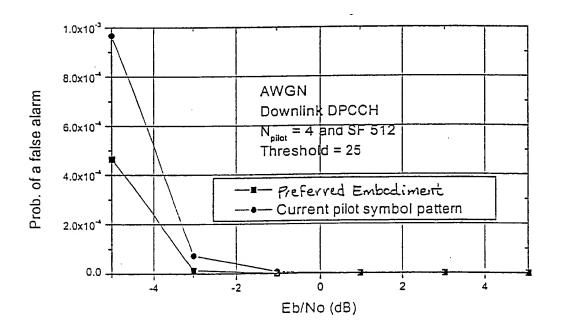
Parameters	Downlink
Slot per frame	. 16
Number of bits in the DPCCH (Pilot/TPC/TFCI)	4/2/0
Number of bits in the DPDCH per each slot	4
Spreding factor (DPDCH)	512
Spreding factor (DPCCH)	512
Modulation	QPSK
3dB bandwidth	4.096MHz
Shaping filter	Root raised cosine (roll off 0.22)
Power amplifier	Ideal
Propogation channel	AWGN

FIG. 18A





**FIG. 18B** 



**FIG. 18C** 



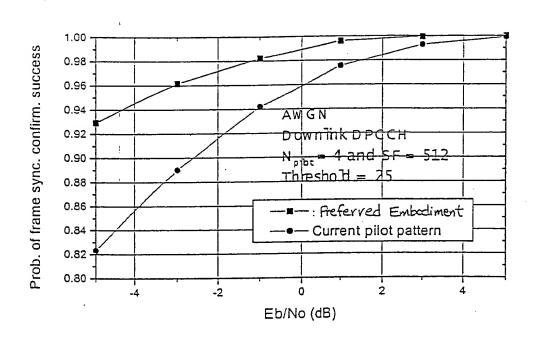


FIG. 18D



	N <sub>pilot</sub> =	N <sub>pilot</sub>	= 8			N, ,=	16	
Symbol #	0 1	0 1	2 3	0	1 2	3	4 5	6 7
Slot #1	01 10	11 00	00 10	11	00 00	10	11 11	00 10
2	00 10	11 01	00 11	11	01 00	11.	11 01	00 00
3	10 10	11 11	00 01	11	11 00	01	11 11	00 10
4	00 10	11 01	00 11	11	01 00	11	11 10	00 11
5	01 10	11 00	00 10	11	00 = 00	1.14	11 11	00 01
6	00 10	11 01	00 11	11	01 00	11	11 =10	00 00
7	01 10	11 11	00 10	11	11 00	10	11 00	00 01
8	00 10	11 10	00 11	11	10 00	11	11 01	00 00
. 9	10 10	11 11	00 01	11	11 00	01	11 00	00 01
10	11 10	11 10	00 00	11	10 00	00	11 10	00 11
- 11	01 10	11 00	00 10	11	00 00	10	11 .00	00 01
12	11 10	11 10	00 200	11	10 00	00.	11 01	00 00
13	10 10	11 11	00 01	11	11 00	01	11 00	00 10
14	11 10	11 10	00 00	11	10 00	00.	11 01	00 11
15	10 10	11 00	00 01	11	-00 00	01	11 11	00 10
16	11 10	11 -01	00 00	11	01 00	00	11 10	00 11

FIG. 19A

Symbol rate	Symbol #	Channel	Corresponding Word of length 16		
		I-CH	-C <sub>1</sub>		
$N_{pilot} = 4$	0	Q-CH	C <sub>2</sub>		
	_	I-CH	-C <sub>3</sub>		
	1	Q-CH	C4		
$N_{pilot} = 8$	_	I-CH	Cı		
	3	Q-CH	-C <sub>2</sub>		
	_	I-CH	-C <sub>3</sub>		
	1	Q-CH	C <sub>4</sub>		
	_	I-CH	Ci		
	3	Q-CH	-C <sub>2</sub>		
$N_{pilot} = 16$	_	I-CH	-C <sub>7</sub>		
	5	Q-CH	C <sub>3</sub>		
		I-CH	C <sub>5</sub>		
	7	Q-CH	-C <sub>6</sub>		

FIG. 19B



				11.14 (2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
Symbol #	0	1	2	3
Slot #1	11	11	00	01
2	11	10	00	.00
3	11	00	00	10
4	11	10	00	.00
5	11	111	00	01
6	11	10	00	00
7	11	11	00	10
8	-11	10	00	11
9	11	00.	00	10
10	11	01	00	11.
11	11	11	00	01
12	11	01	00	11.
13	11	00	00	10
14	11	01	00	11
15	11	00	. 00	01
16	11	01	00	00

FIG. 19C

Symbol #	Channel	Corresponding word of length 16
	I-CH	C <sub>1</sub>
1 .	Q-CH	C <sub>2</sub>
	I-CH	-C <sub>3</sub>
3	Q-CH	-C <sub>4</sub>

FIG. 19D



_												
		$N_{pilot}$	= 8					- *pilot <sup>3</sup>	= 16			
Symbol #	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	00	00	10	11	00	00	10	11	11 :	00	10
2	11	01	00	[11]	11	01	00	11	11	01	00	00
3	11	11	00	01	11	11	00	01	11	ŽI I	00	10
4	11	01.	00	11,	11	101	00	11	11	10	00	11
5	11	00	00	10	11	.00	00	10	11	113	00	01
6	11	01	00	11	11	01	00	11.	11	10	00	00
7	11	11	00	10	11	\$11	00	10	11	00	00	01
8	11	10	00	-11	11	10	00	11	11	01	00	00 *
9	11	11	00	01	11	11	00	01	11	00	00	01
10	11	10	00	00	11	-10	00	00	11	10	00	11
11	11	00	00	10	11	-00	00	10	11	00	00	01.
12	11	10	00	00	11	10	00	00	11	201	00	00
13	11	11	00	01	11	11	00	01	11	00	00	10
14	11	10	00	00	11	10	00	00	11	01	00	ii
15	11	00	00	01	11	.00	00	01	11	11	00	10
16	11	01	00	00	11	01	00	00	11	10	00	11

FIG. 19E

Symbol rate	Symbol #	Channel	Corresponding word of length 16
	_	I-CH	-C <sub>3</sub>
	1	Q-CH	C <sub>4</sub>
$N_{pilot} = 8$		I-CH	C <sub>1</sub>
	3	Q-CH	-C <sub>2</sub>
	_	I-CH	-C <sub>3</sub>
	1	Q-CH	C <sub>4</sub>
		I-CH	C <sub>1</sub>
	3	Q-CH	-C <sub>2</sub>
$N_{pilot} = 16$		I-CH	-C <sub>7</sub>
	5	Q-CH	C <sub>s</sub>
	_	I-CH	C <sub>5</sub>
	7	Q-CH	-C <sub>6</sub>

FIG. 19F



Sequence	Autocorrelation
$C_1 = (1 \ 1 \ 0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 0 \ 0 \ $	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_2 = (1\ 0\ 0\ 0\ 1\ 0\ 1\ 0\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 1)$	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_3 = (1\ 1\ 1\ 1\ 1\ 0\ 1\ 1\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0)$	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_4 = (0\ 1\ 0\ 1\ 0\ 0\ 0\ 1\ 1\ 0\ 1\ 0\ 1\ 1\ 0)$	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_s = (0\ 0\ 1\ 1\ 1\ 0\ 1\ 1\ 1\ 1\ 0\ 0\ 0\ 1\ 0\ 0)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
$C_6 = (0\ 0\ 1\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 0\ 1\ 1\ 0\ 1)$	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4
$C_7 = (0\ 1\ 1\ 1\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 1\ 1\ 1\ 1)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
$C_8 = (1\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 0\ 1\ 0\ 0\ 1\ 0\ 1)$	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4
C <sub>9</sub> = (0 0 1 1 0 1 1 1 1 1 0 0 1 0 0 0)	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
C <sub>10</sub> =(0 0 1 0 1 0 0 1 1 1 0 1 0 1 1 0)	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
C <sub>11</sub> =(1 1 0 0 0 0 0 1 0 0 1 1 1 1 1 0)	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_{12}$ =(1 0 1 1 1 0 0 1 0 1 0 0 0 1 1 0)	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_{13} = (0\ 1\ 0\ 0\ 0\ 0\ 1\ .1\ 1\ 0\ 1\ 1\ 1\ 1\ 0\ 0)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
C <sub>14</sub> =(1 0 0 0 1 0 0 1 0 1 1 1 0 1 1 0)	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4
C <sub>15</sub> =(0 0 0 0 1 0 0 0 1 1 1 1 0 1 1 1)	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
C <sub>16</sub> =(1 0 0 1 0 0 0 1 0 1 1 0 1 1 1 0)	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4

FIG. 20A

R(τ) τ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R <sub>ε</sub> (τ)	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
R <sub>F</sub> (τ)	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
$R_{G}(\tau)$	16	4	0	-4	0	4	0	-4	-16	-4	0	4	0	-4	0	4
$R_H(\tau)$	16	-4	0	4	0	-4	0	4	-16	4	0	-4	0_	4	0	-4

FIG. 20B



	T	<del></del>				• • • • • • • • • • • • • • • • • • • •					
		pilot	<b>=</b> 6					Noilou	= 8		
Bit#	0	1 2	3	4 5	0	1	2	⊤ 3 · 7	4	5 6	#≟-7 + <b>7</b>
Slot#1	ı	1 1	1	1 0	ì	1	l	1	1	$\frac{1}{1}\frac{1}{2}\frac{1}{2}\frac{1}{2}+1$	. 0
2	1	1 0	1	1 1	1	i	ì	0	1	1	1
3	1	0 0	1	1 0	1	<b>o</b> .	1	.0	1	1 1	0
4	1	1 0	1		1	1	1	0	1		71.
5	1	1 1	1	i = 0	1		1		1	131	:0
6	1	1 0	1		1	1	1	0	1	<b>0</b> 1	. 0
7	1		1	1 +0	l		1		1		0
8.	1	-1 0	1		1	0	1	0	1	1 1 1 0 1	
9	1	0 0	1	0 1	1	0	1		1 1	0 1	1 20
10	1	0 £1	1	0 1	1		1		1	1 0 1	115
12	1	0 1	1	0 0	1	0	1		1	0 1	Ô
13	1	0 0	1	0 1	1	0	ı	0	1	<b>0</b> 1	Tri
14	1	0 1	1	i	1	0	1		1	1 = 1	1
15	1	0 0	1	0 1	1	0	l	0	1	<b>0</b> 1	1
16	1	0 t	1	0 0	ı	0	1	1 %	1	0 1	0

**FIG. 20C** 

N <sub>pilots</sub>	Pilot bit position#	Corresponding word of length 16				
	1	Cı				
	2	C <sub>2</sub>				
6	4	C <sub>3</sub>				
	5	C <sub>4</sub>				
	1	C <sub>1</sub>				
	3	C <sub>2</sub>				
8	5	C <sub>3</sub>				
	7	C4				

**FIG. 20D** 



Symbol rate	8	ksps	16	5,32,64,	1281	ksps			25	6,512,1	024	ksps		
Symbol #	0		0	1/2) 1/2)	2	-3 -3	0	i i	2	3	4	15	6	7
Slot#1	11	.11	11	11,	11	10	11	11	11	10	11	:00		01
2	11	10	11	10	11		11	10	11	11	11	-00	11	10
3	11	00	11	00	11	10	11	00	11	10	11	111	11	li
4	11	10	11	10	11	11	11	10	11	11	11	:10	11	11.
5	11	11	11		11	10	11	iii	11	10	11	10	11	701
6	11	310	11	10	11	. 00	11	10	11	00	11	01	11	.00
7	11	il	11	11	11	10	11	11	11	10	11	10	11	01
8	11	10	11	10	11	ii	11	10	11	11	11		11	00.
9	11	-00	11	00	11	01	11	00	11	οî	11	11	11	=10
10	11	¥01.5	11	01	11	00	11	01	11	00	11	11	11	01
11	11	11	11	114	11	01	11		11	01.	11	00 1	11	00
12	11	01	11	01	11	00	11	01	11	00	11	01	11	00
13	11	00	11	00	11	01	11	-00	11	01	11	01	11	210
14	11	01.	11	01	11	111	11	01	11	111	11	10	11	11-
15	11	00	11	00	11	01	11	00 201	11	01	11	.01	11	1ô
16	11	-01	11	01	11	00	11	01	11	00	11	00	11	#i1

FIG. 20E



Symbol rate								2048,40	96ks	ps						
Symbol #	0	1 2	2	<b>.3</b> .*	4	<b>3</b>	6	7.	8	9	10	11	12	13 (i	14	15
Slot#1	11	11 7	11	10	11	-1 -00	11	01	11	.00	11		11	.01	11	01
2	11	10	11	11	11	00	11	10	11	00	11	210	11	10	11	_00
3	11	00	11	10	11	11	11	11	11	11	11	101	11	00	11	00
4	11	- 10	11	ii.	11	10	11	11	11	10	11	01	11	00	11	01
5	11	11	11	10	11	. 10	11	01	11	01	11	01	11	01	11	10
6	11	10	11	00	11	01	11	00	11	10	11	00	11	00	11	00
7	11	11	11	10	11	10	11	01	11	10	11	00	11	10	11	00
8.	11	10	11	11	11	11	11	00	11	11	11	311 211	11	11	11	01
9	11	00	11	01	11	11:	11	10	11	111	11	00	11	10	11	10
10	11	01	11	00	11	-11	11	01	11	111	11	ŽÓI	11	01	11	
11	11	11	11	01	11	00	11	00	11	.00	11	310°	11	iii	11	11
12	11	01	11	00	11	.01	11	00	11	01	11	10	11	113	11	10
13	11	00	11	01	11	01	11	10	11	10	11	10	11	10	11	01
14	11	01	11	11	11	10	11	11	11	-01	11	11	11	11	11	11
15	11	00	11	01 _	11	.01	11	10	11	01	11	11	11	01	11	11
16	11	01	11	00	11	00	11	11	11	00	11	00	11	00	11	10

FIG. 20F



Symbol rate	Symbol #	Channel	Corresponding word
, , , , , , , , , , , , , , , , , , , ,			of length 16
8ksps	1	I-CH	C <sub>1</sub>
окара	<u> </u>	Q-CH	C <sub>2</sub>
	1	I-CH	C <sub>1</sub>
16 22 64 1201	1	Q-CH	C <sub>2</sub>
16, 32, 64, 128ksps	2	I-CH	C <sub>3</sub>
	3	Q-CH	C4
	•	I-CH	C <sub>1</sub>
	1 .	Q-CH	C <sub>2</sub>
		I-CH	C <sub>3</sub>
	3	Q-CH	C <sub>4</sub>
256, 512, 1024ksps		I-CH	C <sub>5</sub>
	5	Q-CH	C <sub>6</sub>
		I-CH	C <sub>7</sub>
	7	Q-CH	Cs
		I-CH	C <sub>1</sub>
	. 1	Q-CH	C <sub>2</sub>
•		I-CH	C <sub>3</sub>
	3	Q-CH	C <sub>4</sub>
		I-CH	C₅
	5	Q-CH	C <sub>6</sub>
	_	I-CH	C <sub>7</sub>
	7	Q-CH	. C <sub>8</sub>
2048, 4096ksps	_	I-CH	C <sub>9</sub>
	9	Q-CH	C <sub>10</sub>
		I-CH	C <sub>11</sub>
	11	Q-CH	C <sub>12</sub>
		I-CH	C <sub>13</sub>
	13	Q-CH	C <sub>14</sub>
		I-CH	C <sub>15</sub>
	15	Q-CH	C <sub>16</sub>

FIG. 20G



	,			<del></del>
Symbol #	0	ı	2	3
Slot #1	11	11	11	10
2	11	10	11	11
3	11	00	11	10
4	11	10	11	11
5	11	11	11	10
6	11	10	11	00
7	11	11	11	10
8	11	10	11	11
9	11	00	11	01
10	11	€ 01 ↔	11	00
11	11	11	11	01
12	11	01.2	11	00
13	11	-00	11	701
14	11	01	11	111
15	11	00	11	201
16	11	01	11	. 00

FIG. 20H

Symbol #	Channel	Corresponding word of length 16
1	I-CH	C <sub>1</sub>
<u>l</u>	Q-CH	C <sub>2</sub>
2	I-CH	C <sub>3</sub>
3	Q-CH	C <sub>4</sub>

FIG. 20I



	Frame Synchronization Words								
L=15, Slot No.	1 2 3 4	15							
	$C_1 = (1\ 0\ 0\ 0\ 1\ 1\ 1\ 1$	0101100)							
	$C_2 = (1\ 0\ 1\ 0\ 0\ 1\ 1\ 0$	1110000)							
	$C_3 = (1\ 1\ 0\ 0\ 0\ 1\ 0\ 0$	1101011)							
	$C_4 = (0\ 0\ 1\ 0\ 1\ 0\ 0\ 0$	0111011)							
	$C_5 = (1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 1 \ 1)$	0010001)							
	$C_6 = (1\ 1\ 0\ 1\ 1\ 1\ 0\ 0$	0010100)							
	$C_7 = (1\ 0\ 0\ 1\ 1\ 0\ 1\ 0$	1111000)							
	$C_8 = (0\ 0\ 0\ 0\ 1\ 1\ 1\ 0$	1100101)							

FIG. 21

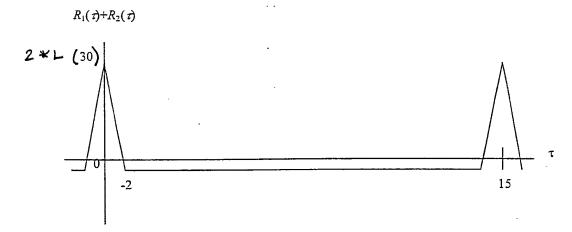


FIG. 22A

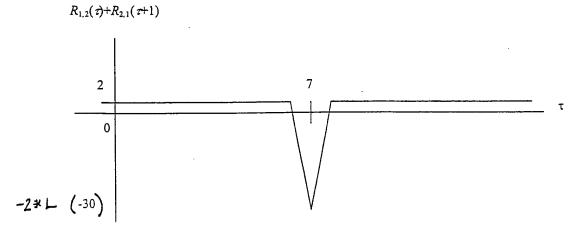


FIG. 22B



 $R_1(\tau) + R_2(\tau) + R_3(\tau) + R_4(\tau)$ 

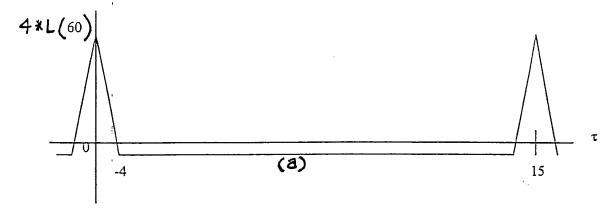
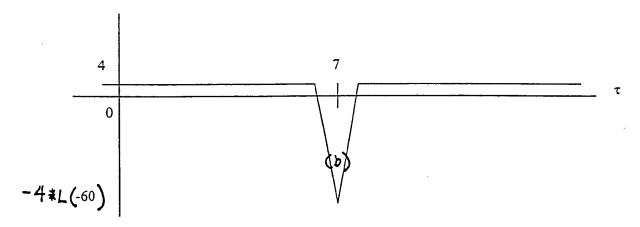


FIG. 22C

$$R_{1,2}(\tau)+R_{2,1}(\tau+1)+R_{3,4}(\tau)+R_{4,3}(\tau+1)$$



**FIG. 22D** 



	N <sub>pilot</sub> =2	N <sub>pilot</sub> =3			N <sub>pilot</sub>	=4	
Bit#	A 0 3 51 3		2	0	宝1章	2	3
Slot#1	1.7 1.4	<b>经1</b> 1 。	1	1	<b>31</b> 2	1	1
2	0 0	0   1	0	1	0.	1	0.
3	0 1 1	0 1	1	1	0.5	1	
4	0 0	0 1	0	1	0 :	1	0
5	1 0	1 1	. 0	:1	: 1	1	0
6		1 1	. 1	1	-71	1	1
7	1 4 4	1 1	1 =	11		1	
8	1 0	1 1	0	1	541	1	0
9	0 - 1	色0割 1	1	·1	表0二	1	1
10	11		1	_1	11	1	12
11	0 1	0 1	1	1	0	1	1
12	1 0	1 1	0	-1	12	1	0
13	1 = 0 =	1 1	<b>□</b> 0	1	<b>31</b>	1	0.
14	0 0	0 1	0	1	10	1	0
15	学0 号 0 3	0 1	-0	1	图0章	1	黎0章

FIG. 23A

$N_{pilot}$	Pilot bit position #	Corresponding word of length 15				
	0	$C_1$				
2	1	C <sub>2</sub>				
	0	Cı				
3	2	C <sub>2</sub>				
	1	C <sub>1</sub>				
4	3	C <sub>2</sub>				

FIG. 23B



	N <sub>p</sub>	ilot=2	, J	J <sub>pilot</sub> =	3		$N_{\rm pilo}$	<sub>t</sub> =4	
Bit #	0	1 4	. 0	1	2	0	<b>建</b> T基	2	3
Slot #1	1	7.1	\$1±	1	1	1	超175	1	1
2	1	o o	10	1	0	1	0	1	0-
3	1	l i	0	1		1	0.0	1	
4	1	0	÷0:	1	0	1	0.	1	Ö
5	1	10		1	0	1	國語	1	0
6	1	1	ii.	1		1		1	212
7	1		31	1	34	1		1	
8	1	20		1	0	1		1	<b>E</b> 0.5
9	1	<b>#1</b>	20-1	1		ī	0	1	
10	1			ī		.1		i	
11	1		0	1		1	ก็	i	
12	1	ō		ī	0	1	T.T.E.	1	- ñ
13	1	l ő	21 ·	1	0	1		1	i n
14	1	0	ñ	1	ň	1	o s	1	ŏ
15	1	0	ŏ	1	0	1	0	1	0

FIG. 23C

N <sub>pilot</sub>	Pilot bit position #	Corresponding word of length 15
2	1	C <sub>1</sub>
3	0	C <sub>1</sub>
J	2	C <sub>2</sub>
4	1	C <sub>1</sub>
	3 .	C <sub>2</sub>

FIG. 23D



**FIG. 23E** 

	N <sub>r</sub>	ilot =	= 5		N <sub>pilot</sub> :	= 6	,
Bit #	0 1	2	3 4	0	1. 2.	3	4 5
Slot #1	1 (3.4)	1	1 0	1	1 1	1	1 0
2	0 0	1	-1 0	1	0 0	1	1 0
3	0-1-1	1	0 1	1	0 2 1 3	1	0 = 1
4	0 5 0	1	. 0 - 0	1	.00	1	= 0 <sub>1</sub> = \$.0 ;
5	1 0	1	0 - 1	1	1 = 50	1	0 51
6	1.5.1	1	1 0	1		1	1 0
7		1	0 = .0 =	1		1	00
8	1 = 30	1	0 0	1	1 0	1	0.240
9	0 1	1	1 0	1	0 3 1	1	1 0
10	1 2 1	1		1		1	
11	0	1	0 1 1	1	至0. [3]	1	_0_1132
12	1 0	1		1	11 10	1	1 31
13	1 = 0	1	is of the control of the	1 ·	1 0	1	0 - 0 -
14	0 = 0	1	1 1	1	0 - 0	1	1. 1
15	0 0	1	i i	1	0 0	1	i Pai

			N,	ilot =	= 7						$N_{pilot}$	= 8			
Bit#	0	\$1°,	2	3	4	. 5	6	0	713	2	÷ 3.,,	4	5.3	6	7
Slot #1	1	1.1	1	1	11	0	1	1	113	1	11	1	113	1	-0
2	1	<b>,</b> 0	0	1		Ò	1	1	0	1	0.1	1		1	0
3	1	0	i i	1	0		1	1	0	1		1	0	1	<b>11</b>
4	1	0	0	1	0	0	1	1	Ó	1	0.4	1	0	1	0
5	1	-1	0	1	0	ii.	1	1	i	1	0	1	0	1	31
6	1			1	11	0	1	1	1	1		1	1	1	0
7	1	1	i	1	0	0	1	1		1		1	+0	1	1,0
8	1	11	0	1	.0	0	1	1	1	1	0	1	0	1	
9	1	0		1	1	10	1	1	0	1	11	1		1	0
10	1	i	1	1	î	1	1	1	1	1	112	1	1	1	1
11	1	0	i	1	0	1	1	1	0	1	1	1	0	1	<b>1</b>
12	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
13	1	1	0	1	0	. 0	1	1	1	1	0	1	0	1	0
14	1	0	0	1	1	1	1	1	0	1	0	1	1.,	1	1
15	1	0	0	1	1	1	. 1	1	0	1	0	1	1	1	11

FIG. 23F



$N_{pilot}$	Pilot bit position #	Corresponding word of length 15
	0 .	C <sub>1</sub>
5	1	, C <sub>2</sub>
)	3	C <sub>3</sub>
	4	C <sub>4</sub>
	1	$C_1$
	2	$_{_{!}}$ $C_{2}$
6	4	C <sub>3</sub>
	5	C <sub>4</sub>
	1	C <sub>1</sub>
7	2	$C_2$
/	4	. C <sub>3</sub>
·	5	C <sub>4</sub> .
	1	C <sub>1</sub>
8	3	C <sub>2</sub>
°	5	C <sub>3</sub>
	7	C <sub>4</sub>

FIG. 23G



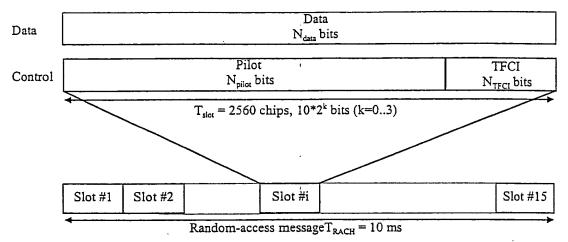


FIG. 23H

Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Frame	Bits/ Slot	N <sub>pilot</sub>	N <sub>TFCI</sub>
15	15	256	150	10	8	2

FIG. 23I

Bit#	0	ail-ifi		<b>≨3</b> -3	4	- 5	6	<b>7</b>
Slot #1	1	113	1	11 3	1	2:1	1	0 -
2	1	0	1	0	1	31.2	1	.0
3	1	: 0 - 1	1	112	1	0	1	11
4	1	₹ <b>0</b> -}	1	0	1	2.0	1	<b>±0</b>
5	1	1	1	. 0 ∹	1	0 🧃	1	至1%
6	1	1	1	1	1	1.7	1	0
7	1	1	1	1	1	0	1	. 0
8	1	1	1	<b>4,0</b> .4	1	0	1	0
9	1	<b>*0</b>	1	11.3	1	<b>E1</b>	1	<u></u> 0
10	1	1	1	11	1	117	1	-1
11	1	0	1	1.1	1	0	1	1 2
12	1	1	1	. 0	1	11.	1	1
13	1	1	1	<b>∵</b> 0	1	.0	1	္ 0
14	1	0	1	0	1	.1 .1	1	1.
15	1	0	1	0	1	1	1	1

FIG. 23J

OCT 2 8 2003 E

	N <sub>pilot</sub> =2	$N_{pil}$	ot = 4		N <sub>pilot</sub>	= 8				-	N <sub>pilot</sub> =	= 16	i	···	
Symbol #	<i>~</i> 10 →	0	1.	0	- <b>1</b>	2	-3	0	1. 1	2	3-7	4	5	6	7.
Slot #1	11	11	11	11	.11	11	: 10	11	11	11	<u>-</u> 10 -	11	211.5	11	10
2	00 =	11	00	11	00	11	10	11	00	11	10	11	11	11	00
3	01	11	01	11	01	11	01	11	01	11	01	11	10_	11	00
4	00 ≥	11	-00-	11	00	11	00	11	.00	11	00	11	01	11	×10
5	-40 ∤	11	710	11	10	11	01	11	10	11	01	11	11	11	112
6	11:	11	11	11	-11	11	計0-	11	11	11	.10	11	01	11	01-
7	113	11	11	11	11	11	100	11	11	11	00	11	10	11	11
8	10	11	-10	11	10	11	00	11	510	11	ે00	11	10	11	00
9	01	11	01	11	01	11	10	11	01	11	10 3	11	-00	11	11
10	41	11	<b>11</b>	11	.11 .01	11	11	11	11	11	11	11	00	11	11
11	-01	11	01	11		11	701	11	01	11	01	11	11	11	10
12	- 10 電	11	10	11	10 10	11	111	11	10	11	11	11	00	11	10
13	10	11	10	11	Will Street and	11	:00	11	10	11	, 00	11	01	11	01
14	00	11	₹00 -	11	00	11		11	00	11	111	11	200	11	<b>-</b> 00
15	≥ 00 🛠	11	00	11	00	11	图1章	11	00	11	111	11	10	11	01

FIG. 24A

Symbol rate	Symbol #	Channel	Corresponding word of length 15
N - 2	0	I-CH	C <sub>1</sub>
$N_{pilot} = 2$	U	Q-CH	C <sub>2</sub>
N - 4	1	I-CH	Ct
$N_{\text{pilot}} = 4$	1	Q-CH	C <sub>2</sub>
	1	I-CH	Ci
N - 9	1	Q-CH	C <sub>2</sub>
$N_{pilot} = 8$	3	I-CH	C <sub>3</sub>
	3	Q-CH	C <sub>4</sub>
	1	I-CH	C <sub>1</sub>
	1	Q-CH	C <sub>2</sub>
	3	I-CH	C <sub>3</sub>
N - 16	3	Q-CH	C <sub>4</sub>
$N_{pilot} = 16$	5	I-CH	C₅
	3	Q-CH	C <sub>6</sub>
	7	I-CH	C <sub>7</sub> .
	/	Q-CH	C <sub>8</sub>

FIG. 24B



	N <sub>pilot</sub>	= 4		N <sub>pilot</sub>	= 8					$N_{pilot}$	= 16	;		
Symbol #	0	1	0	1	2	3	0	1/3	2	3	4	¥ 5	6	7
Slot #1	01	10	11	00	00	10	11	00	00	10	11	:00:	00	10
2	10	10	11	00	00	01	11	00	00	01	11	10	00	10
3	11	10	11	11	00	00	11	.11	00	00	11	10	00	11
4	10	10	11	10	00	01	11	.10	00	01	11	00	00	00
5	00	10	11	11	00	11	11	11	00	11	11	01	00	10
6	01	10	11	.00	00	-10	11	00	00	10	11	113	00	00
7	01	10	11	:10	00	10	11	-10	00	10	11	01	00	11
8	00	10	11	10	00	11	11	10	00	11	11	10	00	ΙĪ
9	11	10	11	00	00	00	11	-00	00	-00	11	101	00	01
10	01	10	11	01	00	10	11	01	00	10	11	01	00	01
11	11	10	11	11	00	00	11	11	00	00	11	00	00	10
12	00	10	11	01	00	111	11	01	00	ii;	11	00	00	01
13	00	10	11	10	00	111	11	10	00	113	11	111	00	00
14	10	10	11	01	00	01	11	01	00	01	11	10	00	01-
15	10	10	11	01	00	01	11	01	00	01	11		00	11

FIG. 24C

Symbol rate	Symbol #	Channel	Corresponding word of length 15
N 4	^	I-CH	-C <sub>1</sub>
$N_{pilot} = 4$	0	Q-CH	C <sub>2</sub>
	1	I-CH	-C <sub>3</sub>
NT 0	1	Q-CH	C <sub>4</sub>
$N_{pilot} = 8$	3	I-CH	C <sub>1</sub>
	3	Q-CH	-C <sub>2</sub>
	1 .	I-CH	-C <sub>3</sub>
	<u>.</u> .	Q-CH	C <sub>4</sub>
	3	I-CH	C <sub>1</sub>
N - 16	3	Q-CH	-C <sub>2</sub>
$N_{pilot} = 16$	5	I-CH	-C <sub>7</sub>
	٥	Q-CH	C <sub>8</sub>
	7	I-CH	C <sub>5</sub>
	/	Q-CH	-C <sub>6</sub>

FIG. 24D



	$N_{pilot} = 8$	3				N <sub>pilot</sub>	= 16	5		
Symbol #	0 1 2	3 -	0	-1	2	₹3 🖫	4	5	6	7.
Slot #1	11 -11 11	10	11	ii	11	10	11	11	11	10
2	11 00 11	10	11	00	11	.10	11	11	11	00
3	11 01 11	01	11	01:	11	01	11	10	11	00
4	11 00 11	00	11	00	11	00	11	01	11	10
5	11 10 11	01	11	10	11	01	11	11	11	111
6	11 11 11	10	11	.11	11	10	11	01	11	01
7	11 11 11	00	11	11	11	00	11	10	11	11
8 -	11 10 11	.00	11	10	11	.00	11	10	11	-00
9	11 01 11	-10	11	01	1Î	10	11	00	11	311
10	11 113 11	11	11	11	11	11	11	00	11	11
11	11 01 11	01	11	01	11	01	11	112	11	10
12	11 10 11	11	11	10	11	<b>311</b>	11	00	11	10
13	11 10 11	-00	11	10	11	00	11	01	11	01
14	11 00 11	11	11	00	11	11	11	.00	11	00
15	11 00 11	11	11	00	11	11	11	10	11	01

FIG. 25A

Symbol rate	Symbol #	Channel	Corresponding word of length 15
	1	I-CH	C <sub>1</sub>
NT _ 0	1	Q-CH	C <sub>2</sub>
$N_{pilot} = 8$	3	I-CH	C <sub>3</sub>
	3	Q-CH	C <sub>4</sub>
	1	I-CH	C <sub>1</sub>
	1	Q-CH	C <sub>2</sub>
	3	I-CH	C <sub>3</sub>
N. 16	3	Q-CH	C <sub>4</sub>
$N_{pilot} = 16$	5	I-CH	C <sub>5</sub>
	. 5	Q-CH	C <sub>6</sub>
	7	I-CH	C <sub>7</sub>
	,	Q-CH	C <sub>8</sub>

FIG. 25B



		N <sub>pilot</sub>	= 8					N <sub>pilot</sub>	= 16			
Symbol #	0	1	2	3 ;	0	(1 <u>1</u>	2	3.1.	4	5	6	7.
Slot #1	11	00	00	10	11	,00	00	10	11	00	00	10
2	11	:00	00	01	11	00	00	01	11	10	00'	10
3	11	11	00	00	11	11	00	00	11	10	00	ii
4	11	10	00	01	11	10	00	01	. 11	00	00	00
5	11	11	00	11	11	ii.	00	11	11	01	00	10
6	11	00	00	10	11	00	00	10	11	11	00	-00
7	11	10	00	10	11	10	00	10	11	01	00	11
8	11	10	00	11	11	10	00	11	11	10	00	11
9	11	00	00	00	11	00	00	00-	11	01	00	01
10	11	<b>.</b> 01	00	10	11	01	00	10.	11	01	00	÷01-
11	11	11	00	00	11		00	- 00	11	00	00	<u>.</u> 10
12	11	01	00	11	11	01	00		11	00	00	<b>201</b>
13	11	10	00	111	11	10	00	<b>Hill</b>	11	11	00	00-
14	11	01	00	01	11	01	00	01	11	10	00	01
15	11	01	00	01	11	01	00	01	11	11	00	î

FIG. 25C

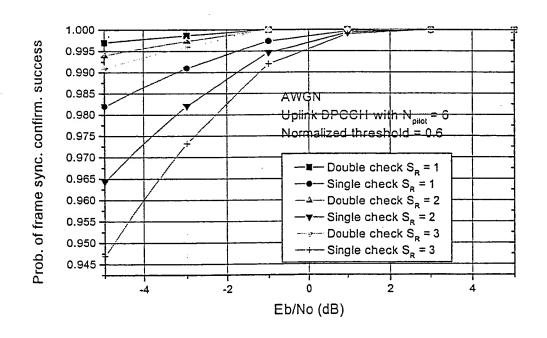
Symbol rate	Symbol #	Channel	Corresponding word of length 15
	1	I-CH	-C <sub>3</sub>
N 0	1	Q-CH	C <sub>4</sub>
$N_{pilot} = 8$	3	I-CH	Cı
	3	Q-CH	-C <sub>2</sub>
	1	I-CH	-C <sub>3</sub>
	1	Q-CH	C <sub>4</sub>
	3	I-CH	C <sub>1</sub>
N - 16	3	Q-CH	-C <sub>2</sub>
$N_{pilot} = 16$	F	I-CH	-C <sub>7</sub>
	5	Q-CH	C <sub>8</sub>
	7	I-CH	C₅
	/	Q-CH	-C <sub>6</sub>

FIG. 25D



Parameters	Uplink
Number of slots per frame	15
Number of bits in the DPCCH (Pilot/TPC/TFCI/FBI)	6/2/2/0
Number of bits in the DPDCH per each slot	10
Spreading factor (DPDCH)	256
Spreading factor (DPCCH)	256
Modulation	HPSK
3dB bandwidth	3.84MHz
Shaping filter	Root raised cosine (roll off 0.22)
Power amplifier	Ideal
Propagation channel	AWGN

**FIG. 26A** 



**FIG. 26B** 



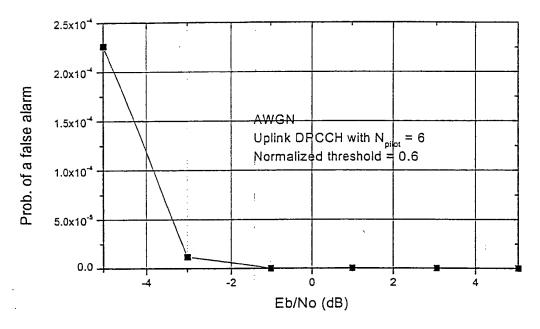


FIG. 26C



## FIG. 27

Item	15 slots	16 slots
No. of slots per frame	15	16
No. of N <sub>pilot</sub> per slot	1) Uplink	1) Uplink
	2, 3, 4, 5, 6, 7, 8	5, 6, 7, 8
	2) Downlink	2) Downlink
	2, 4, 8, 16	4, 8, 16, 32
Slot-Slot possible?	Yes	Yes
Double-check possible?	Yes	Yes
	(Two correltors such as auto-correlator (Auto-correlator)	(Auto-correlator)
	and cross-correlator are used)	
Single frame synchronization word can be used for frame synchronization?	Yes since a frame synchronization word has -1 out-of-phase coefficients.	May not be feasible because of +4 or -4 out-of-phase coefficients. The +4 or -4 side lobes can be zero through some particular processing using preferred pair of frame synchronization words.
Frame syncrhonzation words	All 8 frame synchronization words are made out of a single PN code	All 8 frame synchronization words have +4 or -4 out-of-phase coefficient and minus peak value at middle shift.
Autocorrelation function	$R(\tau)=15, \tau=0$	$R(\tau)=16, \tau=0$
	$R(\tau)=-1$ , elsewhere	$R(\tau)=-16, \tau=8$
		$R(\tau)=0,+4$ , or $-4$ , elsewhere